

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE <div style="text-align: center;">J</div>		PAGE OF PAGES <div style="text-align: center;">1 7</div>	
2. AMENDMENT/MODIFICATION NO. 0003		3. EFFECTIVE DATE 12-Mar-2004		4. REQUISITION/PURCHASE REQ. NO. W26GLG-4015-7946		5. PROJECT NO.(If applicable)	
6. ISSUED BY USA ENGINEER DISTRICT, NORFOLK CONTRACTING OFFICE 803 FRONT STREET NORFOLK VA 23510-1096		CODE W91236		7. ADMINISTERED BY (If other than item 6) <div style="text-align: center; font-weight: bold;">See Item 6</div>			
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X		9A. AMENDMENT OF SOLICITATION NO. W91236-04-B-0007	
				X		9B. DATED (SEE ITEM 11) 02-Feb-2004	
						10A. MOD. OF CONTRACT/ORDER NO.	
						10B. DATED (SEE ITEM 13)	
CODE		FACILITY CODE					
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS							
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.							
12. ACCOUNTING AND APPROPRIATION DATA (If required)							
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.							
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.							
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).							
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:							
D. OTHER (Specify type of modification and authority)							
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.							
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Solicitation No. W91236-04-B-0007, Demolition of Embrey Dam, Phase III, Rappahannock River, Fredericksburg, VA is modified as follows: A. Bid Opening Date is extended to 23 March 2004 at 2:00 PM. <div style="text-align: center; font-weight: bold;">SEE CONTINUATION SHEETS</div>							
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.							
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)			
				TEL: _____ EMAIL: _____			
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED 12-Mar-2004	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

The following items are applicable to this modification:AMENDMENT 0003

- B. The following questions and responses encompasses all questions received to date by this office, including those received at the Pre-bid Conference on 2 March 2004.

QUESTIONS AND ANSWERS

- Question: What will be the cut off date and time to accept questions?
- Answer: There is no official; cut off prior to the bid opening date, but to give us time to distribute the responses to the questions, we would like the questions in by 12:00 am on 8 March.
- Question: Can questions be emailed or faxed. If so, to whose attention?
- Answer: All questions should be emailed or Faxed to our Contracting Branch, Attn: Charlotte Hofstetter. The email address is: Charlotte.G.Hofstetter@NAO02.USACE.ARMY.MIL. The FAX number is (757) 441-7183
- Question: Will we use the same staging area as the previous contractor?
- Answer: The contractor should be off site no later than October. There is a requirement in the contract to work with other contractors in the area. See the accompanying Amendment for changes to Section 01005, Par. 1.7 COORDINATION IN WORK AREAS.
- Question: Is the stone to be pointed everywhere or only in places affected by the demolition work?
- Answer: See accompanying amendment to Section 02220, Par 3.1.3 and 3.1.5.
- Question: Is road sub-base material to be imported to the site or is there an on site borrow area?
- Answer: A considerable amount of sand and clay sands are stored at the disposal area. The contractor may use those materials for the road sub-base.
- Question: Is a special permit(s) required to construct the river crossing to access the north side?
- Answer: The river crossing is covered in a VMRC and DEQ permit. The contractor is required to coordinate with VMRC and DEQ during demolition as specified in the permit. Copies of the permits are included in this amendment.
- Question: In Reference to the Demo Spec, Section 02220, Page 5; "The following items reserved as property of the using Service shall be removed prior commencement of work under this contract: concrete suitable for reuse, wood and iron form the crib dam, and soil and stone excavated or removed from crib dam." What does this mean?
- Answer: See Amendment 2, # 2 under Technical Changes. This replaces the original paragraph and should clarify.
- Question: The paragraph following question 2 states: "Combustible & organic material shall be disposed of in the sanitary land fill area located off site." Does this mean there is a designated area? And if so, where is it?

Answer: The paragraph will be changed as part of this amendment to clarify.

Question: Amendment 2, Section 00010, Item # AH indicated 28,000 sq. yd. Of riparian restoration which is approximately 5.8 acres. However sheet C-112 indicated a total of 6.55 acres of riparian restoration. Which is the correct amount?

Answer: The bid schedule shall be corrected to show the correct amount.

Question: The plant list on sheet C-113 does not specify between bare-root, container or b+b specimens. Would you please clarify?

Answer: Refer to this Amendment for clarification.

Question: Landscape Note # 12 on sheet C-113 indicates the use of sapling sleeves. Please provide a specification for these sleeves and their installation.

Answer: Refer to this Amendment for clarification.

Question: Will the vegetative planting zones be graded or sloped prior to plant installation or will the exposed banks be left as is?

Answer: Only where grading is required on other parts of the drawings. Grading is not a requirement for revegetation of the riparian zone, but revegetation is required for areas designated to be graded.

Question: What is the approximate square foot of zone 3 restoration planting? This item remains a lump sum so the area is required for bidding.

Answer: The bidders should be able to bid this item from the drawings.

Question: General Note #1 on sheet C-113 indicated the use of erosion control matting "as slopes necessitate". Based on current slope conditions should we assume using blankets on all slopes for bidding purposes?

Answer: Refer to this Amendment for clarification.

Question: Will shredded hardwood mulch be required for all plantings/ Woody plantings only? Zone 3 plantings only? Mulch typically is not used in flood prone planting zones.

Answer: Refer to this Amendment for clarification.

Question: Will the mulch currently on-site at lay down area 3 be available for mulching plantings as needed?

Answer: No, the mulch is to be removed by the dredging contractor or his subs.

Question: The planting specifications Section 02930 indicated numerous soil amendments, staking and guying & mulch, which are typically not used on riparian restoration projects and are reserved for standard landscaping work. Do these landscaping specifications apply to the riparian restoration plantings?

Answer: Refer to this Amendment for clarification.

Question: During the 3-year warranty for the planting: is the contractor responsible for replacement of material lost due to storm +high water events?

Answer: Refer to this Amendment for clarification.

Question: Please expand on planting densities for example these are 10 M-L Plant species each on 10' Centers. I assume each species is placed on 10' Centers in relation to other species in that zone. Would this be correct? This would seem most logical to me.

Answer: Yes.

Question: As far as I can tell no grading is required on Zone 1 and Zone 2. Is this correct?

Answer: See answer above.

Question: Grading is needed for the area between the plug and the old stonework (Work Item #14). How will this area be seeded and planted?

Answer: Refer to sheet C-105, Note # 9.

Question: How will all other disturbed areas be planted? Example: Road from Lay down Area 1 to Lay down Area 3 (Work Item #19).

Answer: Only so far as is required for erosion control.

Question: How will the road that is part of Zone 3 on the property of the City of Fredericksburg be planted? This area is to be left as road. Would we plant everything except that?

Answer: Yes, this area is to be left as road.

Question: Clarify Note 17 as it relates to the Guth property.

Answer: Will clarify in this amendment.

Question: Concerning planting on the north side. How will we access the north side in Feb. 2005? Is there leeway in the planting dates? What happens for access during the warranty period?

Answer: Access is the responsibility of the contractor whether during planting season or during warranty period. The planting dates are as required in the bid documents.

- C. A revised Bid Schedule is attached (see changes made below). Permits are attached and become a part of Section 01355. A revised Section 0291 is attached.

1. In Amended Section 00010, Bid Schedule, Item AH change the quantity, "28,000 SY _____" into the following two quantities:

"Zone 1	17,200 SY	_____
Zone 2	14,500 SY	_____

2. In Amended Section 00010, Bid Schedule, Item AF, delete the word "crushing".
3. In Section 01005, Par. 1.7. COORDINATION OF WORK AREAS, add the following:
"The area where work is to be performed will be occupied during the duration of this contract. Other Contractors, the City of Fredericksburg, and local civic organizations (as permitted by the

City) may utilize portions of the property. After award of this contract a meeting will be held with all contractor representatives, the City of Fredericksburg, local civic organizations, and the Contracting Officer to develop a coordination plan. In case of disagreement regarding use of the area the decision of the contracting officer's will control."

4. In Section 01005, Par. 1.7.1 UNOCCUPIED WORK AREA, delete the paragraph and replace with the following:

"The following activities are known to be going on in the area and will require coordination:

- a. Laydown Area 3 may be occupied until mid October by the dredging contractor. A contractor documenting the Crib dam will be on site until 1 July.
- b. The road to the quarry is utilized by several civic organizations.
- c. VA Power has a right of way over the dam for their transmission lines.
- d. The City must have access to their properties at all times.

The contractor's work activities may affect other area(s) that are occupied. All work shall be in accordance with the contractor's work plan."

5. In Section 01005, par. 1.8.1 Project Monitoring/Corrective Actions (Replacement), Change "36 months" to "24 months" in the last sentence in the second paragraph.
6. In Section 01005, par. 1.8.1 Project Monitoring/Corrective Actions (Replacement), Change the first and second sentences in the second paragraph from: "Should the performance criteria outlined below not be met at any time during the monitoring period, corrective actions will be undertaken and documented in the monitoring report. In the event of complex erosion problems, an implementation schedule" To: "Should the performance criteria outlined below not be met at any time during the monitoring period, corrective actions will be undertaken at contractor expense and documented in the monitoring report. In the event of complex erosion problems or flood events that damage previously installed plants, an implementation schedule"
7. In Section 01005, par. 1.8.1 Project Monitoring/Corrective Actions (Replacement), Change the following phrase in the last sentence in the third paragraph from: "Year 3 monitoring" to: "Year 2 monitoring".
8. In Section 01005, par. 1.8.1.1 Performance Criteria #1. At the end of the paragraph "Riparian areas:" Add the following phrase: "Sand islands and other Sediment features that remain in the river following the dam breach are not to be vegetated."
9. In Section 01005, par 1.8.2 Monitoring Report, change the second sentence where it says "three years" change to "two years".
10. In Amended Section 01270, Measurement and Payment, sub par 1.4.5.1 Payment, under Par 1.4.5 Measurement and Payment for Disposal of Steel, Embedded Steel and Cast Iron, delete the word "crushing".
11. In Section 02220, delete Par 3.1.3 Masonry and 3.1.5 Patching. Replace Paragraph 3.1.3 Masonry with the following:

“The block masonry building on the south end of the dam shall be removed. The stone and brick masonry on the south end of the abutment shall remain. The contractor shall meet with the COR and the District Archeologist and discuss work requirements. The contractor shall submit a plan subsequent to that meeting for protection of the historic stonework during demolition. The stone and brick masonry affected by construction activities shall be left in a stable condition. Any stone or brickwork damaged as part of the demolition shall be repositioned and stabilized.

12. In Section 02220, Par. 3.3.4 Unsalvageable Material, delete the following, “in the sanitary fill area located off the site.” To the following: “in off site land fill or land fills approved for the materials disposed of.”
13. In Section 02230, Clearing and Grubbing, delete paragraph under 3.3 Tree Removal and replace with the following: “This work shall include the felling of such trees and cutting-off tree stumps flush with the ground surface. Access gravel road can be built on top of the flush tree stumps in areas where road fill is required. However, in areas where there is a road cut, the removal of tree stumps and roots are necessary and filling the depressions is required, as specified in paragraph Grubbing. Trees shall be disposed of as specified in paragraph Disposal of Trees.”
14. Delete Section 2935, Exterior Plant Material Maintenance.
15. Delete Section 2921, Seeding and Replace with Section 2921, Seeding provided herein.
16. Delete Section 2923, Sprigging and Replace with Section 2923, Sprigging provided herein.
17. Delete Section 2930, Exterior Planting and Replace with Section 2921, Exterior planting provided herein.
18. Replace Amended Drawing G0002, Overall Project Site Plan with new Amended Drawing G0002, Overall Project Site Plan, provided herein.
19. On Drawing Sheet C-113 change the following: Under Note at the bottom of sheet: Add note “2. S-S & M-L may be bare-root, container, or balled & burlapped.”
20. On Drawing Sheet C-113 change the following: Under Landscape Notes: Note 10. replace “36 months” to 24 months” guarantee.
21. On Drawing Sheet C-113 change the following: Under Landscape Notes: Note 11. replace “one year” to “two years” in the ground.
22. On Drawing Sheet C-113 change the following: Under Landscape Notes: Delete Note 12.
23. On Drawing Sheet C-113 change the following: Under Landscape Notes: Note 13 becomes the amended Note 12.
24. On Drawing Sheet C-113 change the following: Under General Notes: Replace Note 1 with “1. Zone 1 shall be sprigged with ‘S-G’ then seeded with the flood plain seed mixture specified.”

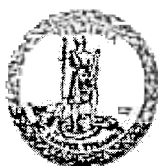
25. On Drawing Sheet C-113 change the following: Under General Notes: Replace Note 2. with, "Zone 2 shall be seeded with the flood plain specified, then covered with erosion control matting made of COIR (coconut fibers) for slopes of 3:1 or greater, then planted with S-S & M-1."
 26. On Drawing Sheet C-113 change the following: Under General Notes: Note 3: Add the sentence, "Zone 3 shall also be seeded with flood plain mixture specified."
 27. On Drawing Sheet C-113 change the following: Under Landscape Notes: Add to Note 9 "or wood chips. Mulch is required only for Zone 3 plantings."
 28. At the end of Specification Section 01355, add the provided attachment including the VMRC and DEQ permits for the contractor's information.
- D. Section 0800, page 137, Clause 52.217-7 is DELETED.
- E.

Section 00010 Solicitation Contract Form

<u>ITEM NO</u>	<u>SUPPLIES/SERVICES</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
0001	FFP- SCHEDULE 1 – BASE BID				
AA	All construction work on the removal of Embrey Dam, complete, exclusive of items 0001AB-0001AJ	1	Lump Sum	_____	_____
AB	All costs in connection with the excavation, sorting, hauling and stockpiling of silts, sands, gravels, loose rock and rubble around the crib dam and concrete dam to support the removal of those structures, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA and AC-AJ	21,000	CY	_____	_____
AC	All costs in connection with furnishing, transporting, stockpiling (if applicable), placing, and constructing the rip rap stone protection, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA-AB and AD-AJ.	1,120	Tons	_____	_____
AD	All costs in connection with the demolition, removal, crushing, sorting, placing, and stockpiling of crushed material, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA-AC and AE-AJ	6,600	CY	_____	_____
AE	All costs in connection with the demolition, removal, preparation (including removal of reinforcing steel), sorting, placing, and constructing rip rap core stone, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA-AD and AF-AJ.	3,100	CY	_____	_____
AF	All costs in connection with the demolition, removal, preparation including, sorting, hauling, and disposal of steel, embedded steel, and cast iron, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA-AE and AG-AJ.	440	Tons	_____	_____
AG	All costs in connection with the geotextile used under rip rap, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA-AF and AH-AJ	8,400	SF	_____	_____
AH	Zone 1	17,200	SY	_____	_____

	Zone 2	14,500	SY	_____	_____
	All costs in connection with the riparian restoration including soil preparation, grading, textile mats, seeding, sprigging and planting, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA-AG and AI-AJ.				
AI		4,050	Tons	_____	_____
	All costs in connection with demolition, removal, preparation including sorting, hauling, and placement in a storage pile of timber and iron in crib dam, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA-AH and AJ.				
AJ		1,000	Tons	_____	_____
	All costs in connection with the hauling and disposal of unsuitable materials offsite, complete, including all work incidental thereto as shown on the drawings and as specified, exclusive of items AA-AI				
	TOTAL BID				
				_____	_____

NOTE: PERMITS ARE FURNISHED FOR THE CONTRACTOR'S INFORMATION AND USE. THE PERMITS ARE FOR THE PROJECT AS A WHOLE. SOME PORTIONS DO NOT CONCERN THIS CONTRACT. THE CONTRACTOR IS TO USE ONLY THE PARTS OF THE PERMITS APPLICABLE TO THIS CONTRACT. THE VMRC PERMIT SHOWS A METHOD OF BUILDING FALSEWORK ACROSS THE RIVER. THE CONTRACTOR MAY USE THIS APPROACH, BUT THE CONTRACTOR MAY CHOOSE OTHER METHODS OF GETTING HIS EQUIPMENT AND MATERIAL ACROSS THE RIVER.



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Taylor N. Smith
Secretary of Natural Resources

Northern Virginia Regional Office
13901 Crown Court
Woodbridge, VA 22193-1453
(703) 583-3800 fax (703) 583-3801
www.deq.state.va.us
August 29, 2002

Robert G. Burnley
Director

Gregory L. Clayton
Regional Director

Mr. Doug Fawcett
Director of Public Works
City of Fredericksburg
P.O. Box 7447
Fredericksburg, Virginia 22404

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

Re: VWP Individual Permit Number 02-0353, Embrey Dam Removal and Installation of Intake, City of Fredericksburg and Stafford County, Virginia, Final VWP Individual Permit

Dear Mr. Fawcett:

Pursuant to the Virginia Water Protection (VWP) Permit Program Regulation 9 VAC 25-210-10 and § 401 of the Clean Water Act Amendments of 1977, Public Law 95-217, the Department of Environmental Quality (DEQ) has enclosed the original VWP individual permit for the Embrey Dam Removal and Installation of Intake project. The proposed project results in the permanent impact of approximately 0.75 acre of palustrine forested wetlands resulting from the construction of an access road and the temporary impact to 1.33 acres of subaqueous land resulting from the construction of a causeway, stabilization of the existing crib dam, and the installation of the intake structure.

The provisions and conditions contained therein according to § 401(a)(1) of the Clean Water Act requires that:

"any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge in the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate, that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this Act."

This permit is valid for ten years from the date of issuance. Reissuance of the permit may be necessary if any portion of the authorized activities or any permit requirement (including compensatory mitigation provisions) have not been completed. The permit term, including any extensions, cannot exceed the maximum of 15 years. The extension may be requested through written notification to the Department of Environmental Quality NVRO, provided that there are no changes in the authorized activities.

Mr. Doug Fawcett
VWP Permit No. 02-0353
August 29, 2002
Page 2 of 2

As provided by Rule 2A.2 of the Supreme Court of Virginia, you have 30 calendar days from the date of service, the date you actually received this decision or the date it was mailed to you, whichever occurred first, within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Department of Environmental Quality. In the event that this decision is served on you by mail, three days are added to that period. Refer to Part 2A of the Rules of the Supreme Court of Virginia for additional requirements governing appeals from administrative agencies.

Alternatively, any owner under §§ 62.1-44.16, 62.1-44.17 and 62.1-44.19 of the State Water Control Law aggrieved by any action of the board taken without a formal hearing, or by inaction of the board, may demand in writing a formal hearing of such owner's grievance, provided a petition requesting such hearing is filed with the board. Said petition must meet the requirements set forth in § 1.23(b) of the board's Procedural Rule Number 1 (9 VAC 25-230-10 et seq. of the Virginia Administrative Code). In cases involving actions of the board, such petition must be filed within 30 calendar days after notice of such action is mailed to such owner by certified mail.

If you have any questions, please contact Trisha M. Renaud at (703) 583-3857.

Sincerely,

Charles D. Forbes
Assistant Division Director
Permitting & Water Resource Development

Enclosures: Permit Cover Page, Part I - Special Conditions, Part II - General Conditions

cc: U.S. Army Corps of Engineers, Michele Cleland
Virginia Marine Resources Commission



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

VWP Individual Permit No. 02-0353

Effective Date: August 29, 2002

Expiration Date: August 28, 2012

VIRGINIA WATER PROTECTION PERMIT ISSUED PURSUANT TO THE STATE WATER CONTROL LAW AND SECTION 401 OF THE CLEAN WATER ACT

Based upon an examination of the information submitted by the owner and in compliance with § 401 of the Clean Water Act as amended (33 USC 1251 et seq.) and the State Water Control Law and regulations adopted pursuant thereto, the board has determined that there is a reasonable assurance that the activity authorized by this permit, if conducted in accordance with the conditions set forth herein, will protect instream beneficial uses and will not violate applicable water quality standards. The board finds that the effect of the impact, together with other existing or proposed impacts to wetlands, will not cause or contribute to a significant impairment to state waters or fish and wildlife resources.

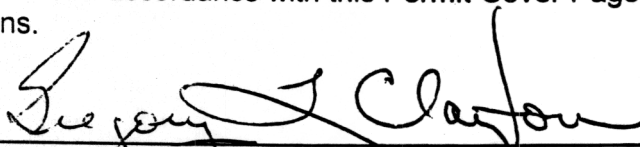
Permittee: City of Fredericksburg, Department of Public Works

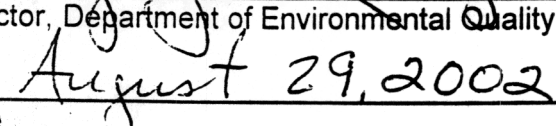
Address: P.O. Box 7447
Fredericksburg, Virginia 22404

Activity Location: The Embrey Dam is located on the Rappahannock River east of the interstate 95 bridge and west of the U.S. Route 1 bridge. The intake is proposed to be located in the Rappahannock River adjacent to the intersection of Ford and Caroline Street in the City of Fredericksburg.

Activity Description: The permittee proposes to remove Embrey Dam and the associated crib dam, dredge approximately 305,350 cubic yards of impounded sediment behind the Embrey Dam, and eliminate the Rappahannock Canal's connection to the river upstream and install an intake at the terminus of the Rappahannock Canal. The proposed activities result in the permanent impact of approximately 0.75 acre of palustrine forested wetlands resulting from the construction of an access road and the temporary impact to 1.33 acres of subaqueous land resulting from the construction of a causeway, stabilization of the existing crib dam, and the installation of the intake structure. Permanent impacts to 0.75 acre of palustrine forested wetlands will be mitigated at a replacement to loss ratio of 2:1 through a contribution to the Nature Conservancy Trust Fund.

The permitted activity shall be in accordance with this Permit Cover Page, Part I - Special Conditions and Part II - General Conditions.



Director, Department of Environmental Quality


Date

Authorized Activities

This permit authorizes the permanent fill of 0.75 acres of palustrine forested wetlands; the dredging of 305,350 cubic yards of sediment from the Rappahannock River; the temporary impact to 1.33 acres of subaqueous land of Rappahannock River; and the installation and operation of a water withdrawal structure on the Rappahannock River as indicated in the Joint Permit Application dated February 21, 2002 and additional information dated March 26, 2002 and May 8, 2002 and deemed complete on May 10, 2002.

The project activities, including any conditions and limitations, shall be adhered to as described in the Joint Permit Application and any supplemental materials approved by DEQ.

The permittee shall notify the DEQ Northern Virginia Regional Office (DEQ-NVRO) of any additional impacts to surface waters, including wetlands, associated with this project. Any additional impacts to surface waters, including wetlands, shall be subject to individual permit review or modification of this permit, and compensation may be required.

This permit is valid for 10 years from the date of issuance. Reissuance of the permit may be necessary if any portion of the authorized activities or any permit requirement (including compensation provisions) has not been completed. The original permit term and extension cannot exceed the maximum of 15 years.

Standard Project Conditions

The activities authorized by this permit shall be executed in a manner to minimize adverse impact on stream beneficial uses, as defined in § 62.1-10(b) of the Code.

No activity shall substantially disrupt the movement of aquatic life indigenous to the water body, including those species that normally migrate through the area, unless the primary purpose of the activity is to impound water. Culverts placed in stream shall be installed to maintain low flow conditions. No activity may cause more than minimal adverse effect on navigation. The activity shall not impede the passage of normal or expected high flows and the structure or discharge shall withstand expected high flows. Flows downstream of the project area shall be maintained to protect all uses.

The permittee shall conduct activities in accordance with the time-of-year (TOY) restrictions of March 01 through June 30, as recommended by the Department of Game and Inland Fisheries. The permittee shall maintain a copy of such TOY restriction or notification that no restriction is necessary, for the duration of the construction phase of the project.

All excavation, dredging, and/or filling in surface waters shall be accomplished in manner that minimizes stream bottom disturbances and turbidity increases.

Virginia Water Quality Standards shall not be violated in any surface water as a result of project activities.

Temporary disturbances to wetlands during construction shall be avoided and minimized to the maximum extent practicable. All temporarily disturbed wetland areas shall be stabilized within 30 days of completing work, restored to pre-construction conditions, and planted or seeded with appropriate wetland vegetation according to cover type (emergent, scrub/shrub, or forested). The permittee shall take all appropriate measures to promote revegetation of temporarily disturbed wetland areas with wetland vegetation by the second year post-disturbance. All temporary fills shall be removed in their entirety and the affected area returned to pre-existing contours.

Heavy equipment in temporarily impacted surface waters shall be placed on mats, geotextile fabric, or other suitable measures to minimize soil disturbance to the maximum extent practical. Mats shall be removed as soon as the work is complete.

All materials (including fill, construction debris, and excavated and woody materials) temporarily stockpiled in wetlands shall be placed on mats or geotextile fabric, immediately stabilized to prevent entry into surface waters, managed such that leachate does not enter surface waters, and entirely removed within 30 days following completion of that construction activity. Disturbed areas shall be returned to original contours, stabilized within 30 days following removal of the stockpile, and restored to the original vegetated state.

All non-impacted surface waters within the project or right-of-way limits that are within fifty feet of any project activities shall be clearly flagged or demarcated for the life of the construction activity within that area. The permittee shall notify all contractors and subcontractors that these marked areas are surface waters where no activities are to occur.

Erosion and sedimentation controls shall be designed in accordance with the Virginia Erosion and Sediment Control Handbook, Third Edition, 1992. These controls shall be placed prior to clearing and grading and maintained in good working order to minimize impacts to surface waters. These controls shall remain in place until the area stabilizes.

Any exposed slopes or streambanks shall be stabilized immediately upon completion of work in each impact area in accordance with the Virginia Erosion and Sediment Control Handbook, Third Edition, 1992.

Continuous flow of perennial springs shall be maintained by the installation of spring boxes, French drains, or other similar structures.

The permittee shall employ measures to prevent spills of fuels, lubricants, or other pollutants into surface waters.

All construction, construction access (for example, cofferdams, sheetpiling, and causeways) and demolition activities associated with this project shall be accomplished in a manner that minimizes construction or waste materials from entering surface waters to the maximum extent practicable, unless authorized by this permit.

5. Untreated stormwater runoff shall be prohibited from directly discharging into any surface waters. In accordance with the Virginia Erosion and Sediment Control Handbook, Third Edition, 1992, appropriate best management practices (BMP) shall be deemed suitable treatment prior to discharge into surface waters.
6. All fill material shall be clean and free of contaminants in toxic concentrations or amounts in accordance with all applicable laws and regulations.

Wet or uncured concrete shall be prohibited from entry into surface waters.

18. No machinery may enter surface waters, unless authorized by this permit.

In issuing this permit, DEQ has not taken into consideration the structural stability of any proposed structure.

C Construction Monitoring

A photo station shall be established at each impact site authorized by this permit. The photograph orientation at each station shall remain constant during all monitoring events. The photographs shall document site activities and conditions, which may include installation and maintenance of erosion and sediment controls; flagged non-impact surface waters; construction access and staging areas; filling, excavation, and dredging activities; culvert installation; dredge disposal; and site stabilization, grading, and associated restoration activities. Photographs shall be taken prior to site activities, at the end of each quarter, and within one week of construction completion. Quarterly photographs at an individual impact site shall not be required until construction activities are initiated at that site. Quarterly photographs at an individual impact site shall not be required following completion of construction at that impact site and the site is stabilized. Each photograph shall be labeled to include the following information: permit number, impact area and photo station number, date and time of the photograph, name of the person taking the photograph, photograph orientation, and photograph subject description.

Required Notifications and Submittals

All written communications required by this permit shall be submitted to the DEQ-NVRO 13901 Crown Court, Woodbridge, Virginia 22193. The permit number shall be included on all correspondence.

All reports required by this permit and other information requested by DEQ shall be signed by the applicant or a person acting in the applicant's behalf, with the authority to bind the applicant. A person is a duly authorized representative only if:

- a. The authorization is made in writing by a person described above; and
- b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

- c. If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization shall be submitted to DEQ prior to or together with any separate information, or applications to be signed by an authorized representative.

- 3 All submittals required by this permit shall contain the following signed certification statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Any fish kills or spills of fuels or oils shall be reported immediately upon discovery. If spills or fish kills occur between the hours of 8:15 AM to 5:00 PM Monday through Friday, DEQ shall be notified at DEQ-NVRO (703) 583-3800; otherwise, the Department of Emergency Services shall be notified at 1-800-468-8892.

Violations of Virginia Water Quality Standards shall be reported within 24 hours to DEQ at DEQ-NVRO (703) 583-3800.

- 6 DEQ shall be notified in writing when potential environmentally threatening conditions are encountered which require debris removal or involve potentially toxic substances. Measures to remove the obstruction, material, or toxic substance or to change the location of any structure are prohibited until approved by DEQ.

Final Plans and Specifications for activities authorized by this permit shall be submitted prior to the beginning of each construction component. Construction shall be performed in accordance with the submitted Plans and Specifications. Any changes to the final construction plans in permitted areas shall be submitted to DEQ prior to construction activities.

- 8 Documentation that the USACE has received the in-lieu fund contribution shall be submitted to DEQ-NVRO 30 days prior the commencement of construction activities in palustrine forested wetlands.
- 9 The permittee shall submit an annual report containing the water withdrawal data in accordance with Part I.H.3 by January 31st of each year for the previous calendar year.

Construction

- 0 DEQ shall be notified in writing at least ten days prior to the initiation of construction activities authorized under this permit so that inspections of the project can be planned, if deemed necessary. The notification shall include identification of the impact areas at which work will occur and a projected schedule for completing work at each permitted impact area.

Construction monitoring reports shall be submitted to DEQ within 30 days of each monitoring event. The reports shall include, as appropriate, the following:

A written narrative stating whether work was performed, a description of the work performed at each impact area, when the work was initiated, and expected date of completion; a summary of activities conducted to comply with the permit conditions; a summary of permit non-compliance events or problems encountered, subsequent notifications, and corrective actions; a summary of anticipated work to be completed during the next reporting period; and an estimated date of project completion.

- b A labeled site map depicting all impact areas and photo stations

Properly labeled photographs as described in Part IC.1

Written notification and photographs shall be submitted within 30 days of restoration demonstrating that all temporarily disturbed wetland areas have been restored in compliance with the permit conditions.

E. Road Crossings

Access roads shall be constructed to minimize the adverse effects on surface waters to the maximum extent practicable and to follow as near as possible pre-construction contours and elevations. Access roads constructed above pre-construction contours and elevations in surface waters shall be properly bridged or culverted to maintain surface flows.

At crossings of perennial streams, pipes and culverts shall be countersunk a minimum of six inches to provide for the re-establishment of a natural stream bottom and to maintain a low flow channel. For multiple-celled culverts, only those cells situated within the limits of ordinary high water shall be countersunk. Countersinking is not required for existing pipes or culverts that are being maintained or extended.

Installation of pipes and road crossings shall occur in the dry via the implementation of cofferdams, sheetpiling, stream diversions or other similar structures.

All surface waters temporarily affected by a road crossing shall be restored to their original elevations immediately following the construction of that particular crossing.

- 5 If stream channelization or relocation is required, all work in surface waters shall be done in the dry, unless authorized by this permit, and all flows shall be diverted around the channelization or relocation area until the new channel is stabilized. This work shall be accomplished by leaving a plug at the inlet and outlet ends of the new channel during excavation. Once the new channel has been stabilized, flow shall be routed into the new channel by first removing the downstream plug and then the upstream plug. The new stream channel shall be constructed following the typical sections submitted with the application. A low flow channel shall be constructed within the channelized or relocated area. The centerline of the low flow channel shall meander, to the extent possible, to mimic natural stream morphology. The rerouted stream flow shall be fully established before construction activities in the old streambed can begin.
- 6 Stream bottom elevations at road crossings shall be measured at the inlet and outlet of the proposed structure and recorded prior to construction and within one week after the completion of construction to ensure that the design elevations were met.

F. Dredging

Dredging shall be accomplished to minimize disturbance of the bottom and minimize turbidity levels in the water column.

- 2 Dredging and excavation shall be limited to the minimum necessary to conduct the permitted activities.
- 3 A dredged material management plan for the designated upland disposal site shall be submitted 30 days prior to the dredging activity.
- 4 The double handling of dredged material in surface waters shall not be permitted.
- 5 All dredged materials pumped by hydraulic method via pipeline to the disposal area will be done in such a manner as to prevent leakage or discharge into surface waters. In the event of a ruptured pipeline, dredging/disposal operations shall immediately cease until repairs are accomplished.
- 6 Side slope cuts of the dredging area shall not exceed a two horizontal to one vertical (2:1) slope to prevent slumping of material into the dredged area.

During transport, dredge material shall be handled in accordance with the transport operation's spill prevention plan. In the event of a spill, the response portions of the plan shall be implemented immediately.

During off-loading, dredge material shall not be handled directly over open water. The off-loading operation shall be conducted in a manner that prevents any discharge of liquids or solids to surface waters.

- 9 The dredge material dewatering area shall be of adequate size to contain the dredge material and to allow for adequate dewatering and settling out of sediment prior to discharge back into surface waters.

The dredge material dewatering area shall utilize an earthen berm or straw bales covered with filter fabric along the edge of the area to contain the dredged material, and shall be properly stabilized prior to placing the dredged material within the containment area.

- 1 Pipeline outfalls and spillways shall be located at opposite ends of the dewatering area to allow for maximum retention and settling time. Filter fabric shall be used to line the dewatering area and to cover the outfall pipe to further reduce sedimentation to surface waters.
- 2 Adequate ground cover or seeding shall be applied to the outside bank of the earthen berm immediately after constructing the berm to minimize soil runoff.

Overtopping of the dredge spoil containment berms with dredge spoil disposal materials post completion shall be prohibited.

G Compensation Using an Approved In-Lieu Fund

The permittee shall compensate for the impacts to 0.75 acres of palustrine forested wetlands at a replacement to loss ratio of 2:1 through the contribution of \$127,500.00 to the Nature Conservancy Trust Fund.

Documentation that the USACE has received the in-lieu fund contribution shall be submitted to DEQ-NVRO 30 days prior to the commencement of construction activities in palustrine forested wetlands.

H Water Withdrawals

The maximum daily withdrawal shall not exceed 4.5 million gallons per day

The intake structure shall have a 0.25 feet per second approach velocity and the intake screens shall be 1.0-mm mesh.

Each day that a water withdrawal occurs, the permittee shall record the date and the amount of water withdrawn on that date. The permittee shall submit an annual report containing this information by January 31st of each year for the previous calendar year.

Part II – General Conditions

A. Duty to comply

The permittee shall comply with all conditions of the VWP permit. Nothing in this permit shall be construed to relieve the permittee of the duty to comply with all applicable federal and state statutes, regulations and prohibitions. Any VWP permit violation is a violation of the law, and is grounds for enforcement action, VWP permit termination, revocation, modification, or denial of an application for a VWP permit extension or reissuance.

B. Duty to cease or confine activity

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the activity for which a VWP permit has been granted in order to maintain compliance with the conditions of the VWP permit.

C. Duty to mitigate

The permittee shall take all reasonable steps to minimize or prevent any impacts in violation of the permit which may have a reasonable likelihood of adversely affecting human health or the environment.

D. VWP permit action

A VWP permit may be modified, revoked and reissued, or terminated as set forth in 9 VAC 25-210 et seq.

If a permittee files a request for VWP permit modification, revocation, or termination, or files a notification of planned changes, or anticipated noncompliance, the VWP permit terms and conditions shall remain effective until the request is acted upon by the board. This provision shall not be used to extend the expiration date of the effective VWP permit. If the permittee wishes to continue an activity regulated by the VWP permit after the expiration date of the VWP permit, the permittee must apply for and obtain a new VWP permit or comply with the provisions of 9 VAC 25-210-185.

- 3 VWP permits may be modified, revoked and reissued or terminated upon the request of the permittee or other person at the board's discretion, or upon board initiative to reflect the requirements of any changes in the statutes or regulations, or as a result of VWP permit noncompliance as indicated in A above, or for other reasons listed in 9 VAC 25-210-180.

E. Inspection and entry

Upon presentation of credentials, any duly authorized agent of the board may, at reasonable times and under reasonable circumstances:

- 1 Enter upon any permittee's property, public or private, and have access to, inspect and copy any records that must be kept as part of the VWP permit conditions;

2. Inspect any facilities, operations or practices (including monitoring and control equipment) regulated or required under the VWP permit, and
3. Sample or monitor any substance, parameter or activity for the purpose of ensuring compliance with the conditions of the VWP permit or as otherwise authorized by law.

F. Duty to provide information

The permittee shall furnish to the board any information which the board may request to determine whether cause exists for modifying, revoking, reissuing or terminating the VWP permit, or to determine compliance with the VWP permit. The permittee shall also furnish to the board, upon request, copies of records required to be kept by the permittee.

2. Plans, specifications, maps, conceptual reports and other relevant information shall be submitted as required by the board prior to commencing construction.

G Monitoring and records requirements

1. Monitoring of parameters, other than pollutants, shall be conducted according to approved analytical methods as specified in the VWP permit. Analysis of pollutants will be conducted according to 40 CFR Part 136 (2000), Guidelines Establishing Test Procedures for the Analysis of Pollutants.
2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart or electronic recordings for continuous monitoring instrumentation, copies of all reports required by the VWP permit, and records of all data used to complete the application for the VWP permit, for a period of at least three years from the date of the expiration of a granted VWP permit. This period may be extended by request of the board at any time.
4. Records of monitoring information shall include:
 - a. The date, exact place and time of sampling or measurements;
 - b. The name of the individuals who performed the sampling or measurements;
The date and time the analyses were performed;
 - d. The name of the individuals who performed the analyses:
The analytical techniques or methods supporting the information such as observations, readings, calculations and bench data used;
The results of such analyses: and
 - g. Chain of custody documentation.

H. Reopener

This permit may be reopened to modify conditions to meet new regulatory standards duly adopted by the board. Cause for reopening a permit includes, but is not limited to when the circumstances on which the permit was based have materially and substantially changed, or special studies conducted by the board or the permittee show material and substantial change, since the time the permit was issued and thereby constitute cause for permit modification or revocation and re-issuance.

Compliance with state and federal law

Compliance with this permit constitutes compliance with the VWP permit requirements of the State Water Control Law. Nothing in this VWP permit shall be construed to preclude the institution of any legal action under or relieve the permittee from any responsibilities, liabilities, or other penalties established pursuant to any other state law or regulation or under the authority preserved by § 510 of the Clean Water Act.

J. Property rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize injury to private property or any invasion of personal rights or any infringement of federal, state or local law or regulation.

K. Transferability

Except as provided for under automatic transfer, a permit shall be transferred only if the permit has been modified to reflect the transfer or has been revoked and reissued to the new permittee. A permit shall be automatically transferred to a new permittee if:

1. The current permittee notifies the board within 30 days of the proposed transfer of the title to the facility or property;
2. The notice to the board includes a written agreement between the existing and proposed permittee containing a specific date of transfer of permit responsibility, coverage and liability to the new permittee, or that the existing permittee will retain such responsibility, coverage, or liability, including liability for compliance with the requirements of any enforcement activities related to the permitted activity; and
3. The board does not within the 30-day time period notify the existing permittee and the new permittee of its intent to modify or revoke and reissue the VWP permit.

L. Civil and criminal liability

Nothing in this permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

M. Unauthorized discharge of pollutants

Except in compliance with this permit, it shall be unlawful for the permittee to dredge, fill or discharge any pollutant into, or adjacent to surface waters, or otherwise alter the physical, chemical or biological properties of surface waters, excavate in wetlands, or on or after October 1, 2001, conduct the following activities in a wetland:

1. New activities to cause draining that significantly alters or degrades existing wetland acreage or functions;
2. Filling or dumping;
3. Permanent flooding or impounding; or
4. New activities that cause significant alteration or degradation of existing wetland acreage or functions.

N. Severability

The provisions of this permit authorization are severable.

- O. Any permittee with an effective VWP permit for an activity that is expected to continue after the expiration date of the VWP permit, without any change in the activity authorized by the VWP permit, shall submit written notification requesting an extension. The permittee must file the request prior to the expiration date of the VWP permit. Under no circumstances will the extension be granted for more than 15 years beyond the original effective date of the VWP permit. If the request for extension is denied, the VWP permit will still expire on its original date and, therefore, care shall be taken to allow for sufficient time for the board to evaluate the extension request and to process a full VWP permit modification, if required.



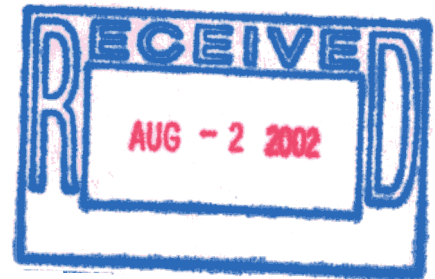
COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Marine Resources Commission
2600 Washington Avenue
Third Floor
Newport News, Virginia 23607

William A. Pruitt
Commissioner

July 31, 2002



Mr. Doug Fawcett
Director of Public Works
City of Fredericksburg, et al
P.O. Box 7447
Fredericksburg, VA 22404

RE: VMRC #02-0353

Dear Mr. Fawcett:

Enclosed is the Marine Resources Commission permit for your proposal to construct a temporary stone causeway and bridge structure across the Rappahannock River immediately upstream of the Embry Dam structure, in association with the Army Corps of Engineers' Embry Dam Removal Project in the City of Fredericksburg and Stafford County.

A yellow placard is also enclosed. This placard reflects the authorized activities for inspection purposes and must be conspicuously displayed at the work site throughout the construction phase. Failure to properly post the placard in a prominent location will be considered a violation of your permit conditions.

YOU ARE REMINDED THAT ANY DEVIATION FROM THE PERMIT OR ATTACHED DRAWINGS REQUIRES PRIOR AUTHORIZATION FROM THE MARINE RESOURCES COMMISSION. FAILURE TO OBTAIN THE NECESSARY MODIFICATION WILL BE CONSIDERED A VIOLATION AND COULD SUBJECT YOU TO CIVIL CHARGES IN AMOUNTS NOT TO EXCEED \$10,000 PER VIOLATION.

July 31, 2002

The work authorized by this permit is to be completed by June 18, 2005. Please note that in conformance with Special Condition 17 of your permit you are to notify the Commission prior to commencement of your permitted project. The enclosed self-addressed, stamped post card is to be used for this purpose. All other conditions of the permit will remain in effect.

Please be advised that you may also require issuance of a U. S. Army Corps of Engineers permit before you begin work on this project. You may wish to contact them directly to verify any permitting requirements.

Sincerely,



Robert W. Grabb
Chief, Habitat Management

RWG/bac
HM
Enclosure

cc: U. S. Army Corps of Engineers
Fredericksburg Wetlands Board
Stafford County Wetlands Board
Ms. Michele Cleland, Environmental Analysis Team, U. S. Army Corps of Engineers

**COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
PERMIT**

The Commonwealth of Virginia, Marine Resources Commission, hereinafter referred to as the Commission, on this 18th day of June, 2002, hereby grants unto:

**City of Fredericksburg
Post Office Box 7447
Fredericksburg, Virginia 22404**

**U.S. Army Corps of Engineers
Norfolk District
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510**

hereinafter referred to as the Permittee, permission to:

 X Encroach in, on, or over State-owned subaqueous bottoms pursuant to Chapter 12, Subtitle III, of Title 28.2 of the Code of Virginia.

Use or develop tidal wetlands pursuant to Chapter 13, Subtitle III, of Title 28.2 of the Code of Virginia.

Permittees are hereby authorized to construct a temporary stone causeway and bridge structure across the Rappahannock River immediately upstream of the Embury Dam structure, in association with the Army Corps of Engineers' Embury Dam Removal Project in the City of Fredericksburg and Stafford County. All activities authorized herein shall be accomplished in conformance with the plans and drawings dated received, February 28, 2002, which are attached and made a part of this permit.

This permit is granted subject to the following conditions:

- (1) The work authorized by this permit shall be completed by **June 18, 2005**. The Permittee shall notify the Commission when the project is completed. The completion date may be extended by the Commission in its discretion. Any such application for extension of time shall be in writing prior to the above completion date and shall specify the reason for such extension and the expected date of completion of construction. All other conditions remain in effect until revoked by the Commission or the General Assembly.
- (2) This permit grants no authority to the Permittee to encroach upon the property rights, including riparian rights, of others.
- (3) The duly authorized agents of the Commission shall have the right to enter upon the premises at reasonable times, for the purpose of inspecting the work being done pursuant to this permit.
- (4) The Permittee shall comply with the water quality standards as established by the Department of Environmental Quality, Water Division, and all other applicable laws, ordinances, rules and regulations affecting the conduct of the project. The granting of this permit shall not relieve the Permittee of the responsibility of obtaining any and all other permits or authority for the projects.
- (5) This permit shall not be transferred without written consent of the Commissioner.
- (6) This permit shall not affect or interfere with the right vouchsafed to the people of Virginia concerning fishing, fowling and the catching of and taking of oysters and other shellfish in and from the bottom of acres and waters not included within the terms of this permit.
- (7) The Permittee shall, to the greatest extent practicable, minimize the adverse effects of the project upon adjacent properties and wetlands and upon the natural resources of the Commonwealth.
- (8) This permit may be revoked at any time by the Commission upon the failure of the Permittee to comply with any of the terms and conditions hereof or at the will of the General Assembly of Virginia.
- (9) There is expressly excluded from the permit any portion of the waters within the boundaries of the Baylor Survey.
- (10) This permit is subject to any lease of oyster planting ground in effect on the date of this permit. Nothing in this permit shall be construed as allowing the Permittee to encroach on any lease without the consent of the leaseholder. The Permittee shall be liable for any damages to such lease.
- (11) The issuance of this permit does not confer upon the Permittee any interest or title to the beds of the waters.
- (12) All structures authorized by this permit which are not maintained in good repair shall be completely removed from State-owned bottom within three (3) months after notification by the Commission.
- (13) The Permittee agrees to comply with all of the terms and conditions as set forth in this permit and that the project will be accomplished within the boundaries as outlined in the plans attached hereto. Any encroachment beyond the limits of this permit shall constitute a Class 1 misdemeanor.
- (14) This permit authorizes no claim to archaeological artifacts which may be encountered during the course of construction. If, however, archaeological remains are encountered, the Permittee agrees to notify the Commission, who will, in turn notify the Department of Historic Resources. The Permittee further agrees to cooperate with agencies of the Commonwealth in the recovery of archaeological remains if deemed necessary.
- (15) The Permittee agrees to indemnify and save harmless the Commonwealth of Virginia from any liability arising from the establishment, operation or maintenance of said project.

The following special conditions are imposed on this permit.

The yellow placard accompanying this permit document must be conspicuously displayed at the work site throughout the construction phase of the authorized activity.

Permittees agree to notify the Commission a minimum of 15 days prior to the start of the construction activities authorized by this permit.

The Virginia Erosion and Sediment Control Handbook (3rd Ed., 1992) will be followed throughout construction.

The temporary stone causeway and bridge structure will be removed, in their entirety, and disposed of in an upland location following the completion of the Embry Dam Removal Project.

Permittees agree to coordinate with the Department of Game and Inland Fisheries, concerning time of year restrictions to protect spawning anadromous fish.

Permittees agree to coordinate with the Department of Conservation and Recreation and the Rappahannock Scenic River Advisory Board in the development of final plans for the restoration of the river corridor in the vicinity of the project.

A permit issuing fee of: \$100.00

A royalty fee of: N/A Governmental Exemption

for a total of \$100.00.

This permit consists of 8 sheets.

PERMITTEE

Permittee's signature is affixed hereto as evidence of acceptance of all of the terms and conditions herein.

In cases where the Permittee is a corporation, agency or political jurisdiction, please assure that the individual who signs for the Permittee has proper authorization to bind the organization to the financial and performance obligations which result from activity authorized by this permit.

PERMITTEE

Accepted for City of Fredericksburg, Virginia

22nd day of July 20 02

By

(Name) (Title)

State of VirginiaCity (or County) of Fredericksburg to-wit:

Marvin S. Bolinger, City Manager

I, Debra Adams, a Notary Public in and for said City (or County) and State hereby certify that Marvin S. Bolinger, Permittee, whose name is signed to the foregoing, has acknowledged the same before me in my City (or County) and State aforesaid.

Given under my hand this 22nd day of July, 2002

My Commission Expires: January 31, 2004

Notary Public

Debra Adams
(I was commissioned Debra Adams)

COMMISSION

IN WITNESS WHEREOF, the Commonwealth of Virginia, Marine Resources Commission has caused these presents to be executed in its behalf by Robert W. Grabb, Chief, Habitat Management
(Name) (Title) Marine Resources Commission

31st day of July, 2002

by

State of Virginia

City of Newport News, to wit:

I, Barbara A. Cundiff, a Notary Public within and for said City, State of Virginia, hereby certify that Robert W. Grabb, whose name is signed to the foregoing, bearing the 18th of June, 2002, has acknowledged the same before me in City aforesaid.

Given under my hand this 31st day of July, 2002

My Commission Expires: 4-30-2003

Notary Public

Barbara A. Cundiff

Entered into record
at Commission meeting

on 6/18/02

by map
Figure 3. USGS TOPO VICINITY MAP
EMBREY DAM REMOVAL PROJECT

**FREDERICKSBURG QUADRANGLE
VIRGINIA
7.5-MINUTE SERIES (TOPOGRAPHIC)**

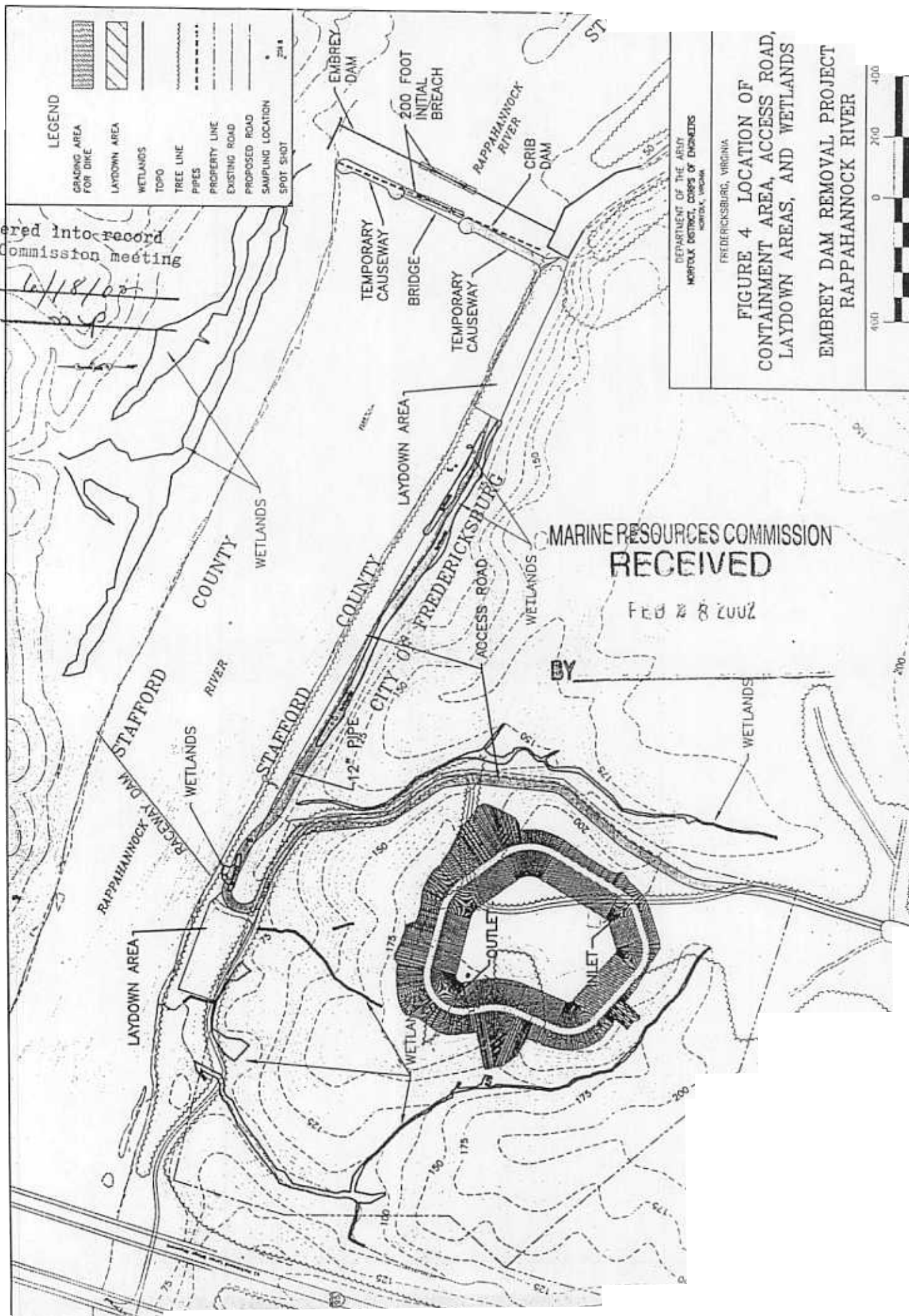
3 597 500 METERS 77°22'30" 38°22'30"

NATURAL RESOURCES COMMISSION
RECEIVED

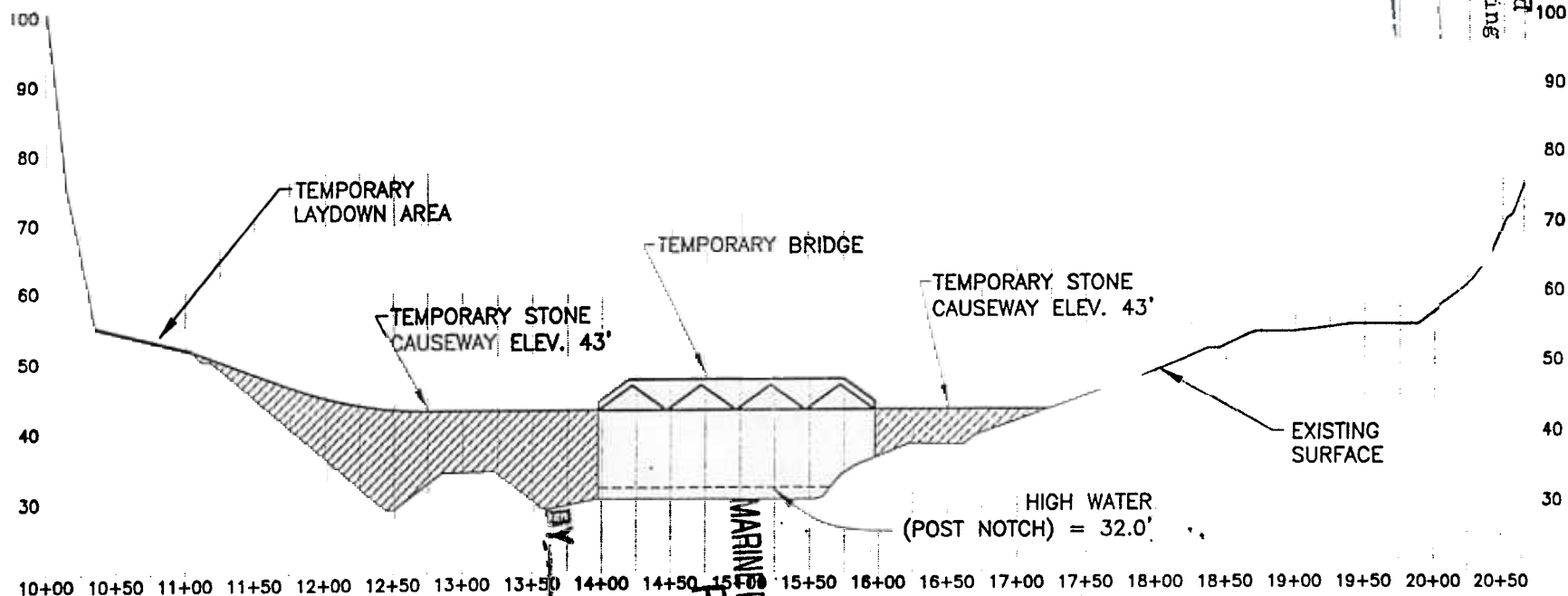
FEB 4 8 2002



Entered into record
at Commission meeting
on 6/18/02
by [signature]



Stationing Info record
 to Construction Meeting
 on 6/14/20
 by HSP



MARINE RESOURCES COMMISSION
 RECEIVED
 FEB 28 2002

DEPARTMENT OF THE ARMY NORFOLK DISTRICT, CORPS OF ENGINEERS NORFOLK, VIRGINIA
FREDERICKSBURG, VIRGINIA FIGURE R-2 CROSS SECTION DRAWING TEMPORARY CAUSEWAY & BRIDGE EMBREY DAM REMOVAL PROJECT RAPPAHANNOCK RIVER
125 0 62.5 125

Embrey Dam Removal Project Permit Application

2. Appendix R- Road Crossing

The proposed bridge is a temporary causeway and bridge to allow removal of the existing dam. The dam cannot be removed without access to work in the Rappahannock River and therefore, a causeway will need to be constructed to cross the river.

The design will be built to a 43 foot elevation to keep the road at the level of the 1 year storm. The causeway will be built from Class I stone with the outer five feet being Class II stone to resist the effects of river velocity during high water events. The stone will be choked with smaller stone such as #57 stone to create a driving surface for large trucks and construction equipment. Four 100-foot turning radius areas will also be provided to allow equipment to pass and turn (Figure R-1).

A way for water to escape will have to be provided as the causeway will act as a dam if it blocks all or part of the flow of the river. The Rappahannock River tends to rise and fall rapidly, making it very difficult to size culverts that would allow water to flow below the surface of the causeway. Therefore, a 200-foot span bailey type bridge will be provided (a steel truss bridge for use in temporary water crossings). The bridge should be built to withstand 12 cfs velocity (100-year flood event), the weight of heavy construction equipment, and complete inundation. It is expected that the causeway may require some repair after any high water event. The causeway and bridge will be removed in their entirety at the end of the project.

FEB 28 2002

SECTION 02921

SEEDING
11/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 602	(1995a; R 2001) Agricultural Liming Materials
ASTM D 4972	(2001) pH of Soils
ASTM D 5268	(1992; R 1997) Topsoil Used for Landscaping Purposes
ASTM D 5883	(1996; R 2002) Use of Rotary Kiln Produced Expanded Shale, Clay or Slate (ESCS) as a Mineral Amendment in Topsoil Used for Landscaping and Related Purposes

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1940; R 1988; R 1998) Federal Seed Act
--------------	---

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment; G
Surface Erosion Control Material; G
Manufacturer's literature including physical characteristics, application and installation instructions for equipment, surface erosion control material and chemical treatment material.

A listing of equipment to be used for the seeding operation.

Delivery; G

Delivery schedule.

Finished Grade and Topsoil; G

Finished grade status.

Topsoil;

Availability of topsoil from the stripping and stock piling operation.

Quantity Check

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed.

Seed Establishment Period

Calendar time period for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described.

Maintenance Record

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

SD-06 Test Reports

Equipment Calibration

Certification of calibration tests conducted on the equipment used in the seeding operation.

Soil Test

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

Seed; G
Topsoil; G
pH Adjuster
Fertilizer
Organic Material
Mulch

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Seed. Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

b. pH Adjuster. Calcium carbonate equivalent and sieve analysis.

c. Fertilizer. Chemical analysis and composition percent.

d. Organic Material: Composition and source.

e. Mulch: Composition and source.

1.3 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.3.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.3.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements.

1.3.3 Storage

Materials shall be stored in designated areas. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with seeding operation materials.

1.3.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.3.5 Time Limitation

Hydroseeding time limitation for holding seed in the slurry shall be a maximum 24 hours.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Seed Classification

State-certified seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS Seed Act and applicable state seed laws.

2.1.2 Permanent Seed Species and Mixtures

Permanent seed species and mixtures shall be proportioned per VESCH for permanent seeding and the specifications as shown on the drawings.

Seed mixtures shall not contain millet or any other large-seed producing grass.

2.1.3 Temporary Seed Species

Temporary seed species for surface erosion control or overseeding shall be per the VESCH.

Seed mixtures shall not contain millet or any other large-seed producing grass.

2.1.4 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.1.5 Seed Mixing

The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed.

2.1.6 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite in accordance with Section 02300 EARTHWORK. Topsoil shall be free from slag, cinders, lumps of soil, sticks, roots, or trash. Topsoil shall be free from viable plants and plant parts. This paragraph applies to Zone 3 areas only.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, organic material and soil conditioners meeting the following requirements. Vermiculite shall not be used. This paragraph applies to Zone 3 areas only.

2.3.1 pH Adjuster

The pH adjuster shall be an agricultural liming material in accordance with ASTM C 602. These materials may be burnt lime, hydrated lime, ground limestone, sulfur, or shells. The pH adjuster shall be used to create a favorable soil pH for the plant material specified.

2.3.2 Soil Conditioner

Soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for use singly or in combination to meet the requirements of the soil test.

2.3.2.1 Sand

Sand shall be clean and free of toxic materials. Gradation: A minimum 95 percent by weight shall pass a No. 10 sieve and a minimum 10 percent by weight shall pass a No. 16 sieve. Greensand shall be balanced with the inclusion of trace minerals and nutrients.

2.3.2.2 Expanded Shale, Clay, or Slate (ESCS)

Rotary kiln produced ESCS material shall be in conformance with ASTM D 5883.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.4.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice, furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

2.4.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings, furnished in an air-dry condition suitable for placing with commercial mulch-blowing equipment.

2.4.3 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.4.4 Paper Fiber

Paper fiber mulch shall not be used.

2.5 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant life.

2.6 SURFACE EROSION CONTROL MATERIAL

Surface erosion control material shall conform to the following:

2.6.1 Surface Erosion Control Blanket

Blanket shall be machine produced matting of coir (coconut fiber).

2.6.2 Surface Erosion Control Fabric

Fabric shall be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips shall have a minimum life of 6 months.

2.6.3 Surface Erosion Control Net

Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1 inch square.

2.6.4 Surface Erosion Control Chemicals

Chemicals shall be high-polymer synthetic resin or cold-water emulsion of selected petroleum resins.

2.6.5 Hydrophilic Colloids

Hydrophilic colloids shall be physiologically harmless to plant and animal life without phytotoxic agents. Colloids shall be naturally occurring, silicate powder based, and shall form a water insoluble membrane after curing. Colloids shall resist mold growth.

2.6.6 Erosion Control Material Anchors

Erosion control anchors shall be as recommended by the manufacturer. Use of 1x1x3 or 1x2x3 oak stakes on all critical corners and joints of erosion control materials. Stake should be left 3-4 inches above the soil level so that the material does not rise over it during extreme flow conditions.

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Seed shall be installed from 15 FEB to 15 APR for spring establishment.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed.

When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. The calibration test results shall be provided within 1 week of testing.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Contractor shall verify that finished grades are as indicated on drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 02300 EARTHWORK, prior to the commencement of the seeding operation.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying pH Adjuster

The pH adjuster shall be applied as recommended by the soil test and the application rate shall be per the test results. The pH adjuster shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage operation.

3.2.2.2 Applying Fertilizer

The fertilizer shall be applied as recommended by the soil test and the

application rate shall be per the soil test results. Fertilizer shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage or hydroseeding operation.

3.2.2.3 Applying Soil Conditioner

The soil conditioner shall be as recommended by the soil test. The soil conditioner shall be spread uniformly over the soil a minimum 1 inch depth and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4 inch depth. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum 2 inch depth by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1-horizontal-to-1 vertical and steeper, no tillage is required. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The pH adjuster, fertilizer, and soil conditioner may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.

3.2.4.2 Protection

Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Installing Seed

Seeding method shall be Broadcast Seeding, Drill Seeding, or Hydroseeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Absorbent polymer powder shall be mixed with the dry seed at the rate recommended by the manufacturer.

3.3.1.1 Broadcast Seeding

Seed shall be uniformly broadcast per the drawings. Half the total rate of seed application shall be broadcast in 1 direction, with the remainder of

the seed rate broadcast at 90 degrees from the first direction. Seed shall be covered a maximum 1/4 inch depth by disk harrow, steel mat drag, cultipacker, or other approved device.

3.3.1.2 Drill Seeding

Seed shall be uniformly drilled to a maximum 1/2 inch depth and at the rate per the drawings, using equipment having drills a maximum 7 inches distance apart. Row markers shall be used with the drill seeder. Half the total rate of seed application shall be drilled in 1 direction, with the remainder of the seed rate drilled at 90 degrees from the first direction. The drilling equipment shall be maintained with half full seed boxes during the seeding operations.

3.3.2 Hydroseeding

Seed shall be mixed to ensure broadcast at the rate per the drawings. Seed and fertilizer shall be added to water and thoroughly mixed to meet the rates specified. The time period for the seed to be held in the slurry shall be a maximum 24 hours. Wood cellulose fiber mulch and tackifier shall be added at the rates recommended by the manufacturer after the seed, fertilizer, and water have been thoroughly mixed to produce a homogeneous slurry. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled.

3.3.3 Mulching

3.3.3.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 2 tons per acre.

Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.3.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.3.3 Asphalt Adhesive Tackifier

Asphalt adhesive tackifier shall be sprayed at a rate between 10 to 13 gallons per 1000 square feet. Sunlight shall not be completely excluded from penetrating to the ground surface.

3.3.3.4 Non-Asphaltic Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.3.3.5 Asphalt Adhesive Coated Mulch

Hay or straw mulch may be spread simultaneously with asphalt adhesive applied at a rate between 10 to 13 gallons per 1000 square feet, using power mulch equipment which shall be equipped with suitable asphalt pump and nozzle. The adhesive-coated mulch shall be applied evenly over the surface. Sunlight shall not be completely excluded from penetrating to the ground surface.

3.3.3.6 Wood Cellulose Fiber

Wood cellulose fiber shall be applied as part of the hydroseeding operation. The mulch shall be mixed and applied in accordance with the manufacturer's recommendations.

3.3.4 Watering Seed

Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum 1 inch depth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

3.4 SURFACE EROSION CONTROL

3.4.1 Surface Erosion Control Material

Where indicated or as directed, surface erosion control material shall be installed in accordance with manufacturer's instructions. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade.

3.4.2 Temporary Seeding

The application rate shall be per VSESC. Required within seven days if the time is not within the allocated window for permanent seeding or when a quick cover is required to prevent surface erosion; the areas designated shall be seeded in accordance with temporary seed species listed under Paragraph SEED.

3.4.2.1 Soil Amendments

When soil amendments have not been applied to the area, the quantity of 1/2 of the required soil amendments shall be applied and the area tilled in accordance with paragraph SITE PREPARATION. The area shall be watered in accordance with paragraph Watering Seed.

3.4.2.2 Remaining Soil Amendments

The remaining soil amendments shall be applied in accordance with the paragraph Tillage when the surface is prepared for installing seed.

3.5 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

3.6 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

3.6.1 Technical Representative

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control. They may be present during treatment application.

3.6.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately. A pesticide plan shall be submitted.

3.7 RESTORATION AND CLEAN UP

3.7.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

3.7.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.8 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as required.

3.9 SEED ESTABLISHMENT PERIOD

3.9.1 Commencement

The seed establishment period to obtain a healthy stand of grass plants shall begin on the first day of seeding work under this contract and shall continue through the remaining life of the contract and end 24 months after the last day of the seeding operation required by this contract. Written calendar time period shall be furnished for the seed establishment period. When there is more than 1 seed establishment period, the boundaries of the seeded area covered for each period shall be described. The seed establishment period shall be coordinated with Sections 02923 SPRIGGING,

and 02930 EXTERIOR PLANTING. The seed establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.9.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for species and health when the grass plants are a minimum 1 inch high.

3.9.2.1 Field Area

A satisfactory stand of grass plants from the seeding operation for a field area shall be a minimum 100 grass plants per square foot. The total bare spots shall not exceed 2 percent of the total seeded area.

3.9.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic.

3.9.3.1 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.9.3.2 Repair or Reinstall

Unsatisfactory stand of grass plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION 3.2, 3.3 and 3.4.

3.9.3.3 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants. See Monitoring/Corrective Actions, Sec 01005, 1.8.1

-- End of Section --

SECTION 02923

SPRIGGING
01/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 602 (1995a; R 2001) Agricultural Liming
Materials

ASTM D 4972 (2001) pH of Soils

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act (1940; R 1988; R 1998) Federal Seed Act

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment

Manufacturer's literature, including physical characteristics, application and installation instructions for equipment and chemical treatment material.

A listing of equipment to be used for the sprigging operation.

Delivery

Delivery schedule.

Finished Grade

Finished grade status.

Topsoil

Availability of topsoil from the stripping and stock piling operation.

Quantity Check

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed. The quantity of sprigs used shall be compared against the total area installed.

Sprig Establishment Period

Calendar time period for the sprig establishment period. When there is more than 1 sprig establishment period, the boundaries of the sprigged area covered for each period shall be described.

Maintenance Record

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

Application of Pesticide

Pesticide treatment plan with sequence of treatment work with dates and times. The pesticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material, application rate of active ingredients, method of application, area treated, amount applied; and the name and state license number of the state certified applicator shall be included.

SD-04 Samples

Samples taken from several locations at the source.

Soil Amendments

A 10 pound sample.

Temporary Seeding

Sample of annual seed species and application rate.

SD-06 Test Reports

Equipment Calibration

Certification of calibration tests conducted on the equipment used in the sprigging operation.

Soil Test; G

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

Sprigs

Seed

Fertilizer

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

- a. Sprigs. Cultivar name, genetic purity and field location.
- b. Seed. Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.
- c. Fertilizer. Chemical analysis and composition percent.

1.3 SOURCE INSPECTION

The sources of sprig material and delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Sprigs

Sprigs shall be protected during delivery to prevent desiccation, internal heat buildup, or contamination.

1.4.2 Inspection

Sprigs shall be inspected upon arrival at the jobsite for conformity to cultivar and genetic purity. Sprigs shall have attached roots with 2 to 3 nodes and shall be 18 inches in length, with no adhering soil, weed stems, or roots. Sprigs that have been exposed to heat or excessive drying shall be rejected. Seed shall be inspected upon arrival at the job site for conformity to cultivar and quality. Seed that is wet, moldy, or bears a test date 5 months or older, shall be rejected. Other materials shall be inspected for compliance. The following shall be rejected: open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter; and topsoil that contains viable plants and plant parts. Unacceptable materials shall be removed from the job site.

1.4.3 Storage

1.4.3.1 Sprigs

Sprigs shall be stored in designated areas and covered with moist burlap, straw, or other covering. Covering shall allow air to circulate preventing internal heat from building up. Sprigs shall be protected from exposure to wind, and direct sunlight until installed.

1.4.3.2 Other Material Storage

Materials shall be stored in designated areas. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions

and not with plant material or other materials.

1.4.4 Handling

Sprigs shall not be damaged during handling. Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.4.5 Time Limitation

Time limitation between harvesting and installing sprigs shall be a maximum 24 hours. Hydroseeding time limitation for holding seed in the slurry shall be a maximum 24 hours.

1.5 EXPERIENCE

The subcontractor shall provide evidence of at least three(3) successful plantings during the past six(6) years in the Mid-Atlantic states, preferably in a riverine environment.

PART 2 PRODUCTS

2.1 SPRIGS

2.1.1 Sprig Cultivar

The cultivar of shall be healthy living stems, stolons, or rhizomes. They shall have attached roots and be a minimum of 18 inches in height that include 2 to 3 nodes.

2.1.2 Quality

Sprigs shall be grown under climatic conditions similar to those in the locality of the project. Sprigs shall have no adhering soil, weed stems, or roots. Sprigs shall be obtained from heavy and dense sod, and shall be free from material detrimental to a healthy stand of grass plants. Sprigs that have been exposed to heat or excessive drying shall be rejected.

2.2 SEED

2.2.1 Seed Classification

State-certified seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS Seed Act and applicable state seed laws.

2.2.2 Temporary Seed Species

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.3 SUBSTITUTIONS

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.4 SOIL AMENDMENTS

Soil amendments shall consist of fertilizer meeting the following

requirements. Vermiculite shall not be used.

2.4.1 Fertilizer

It shall be as recommended by the soil test. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.4.2 Soil Conditioner

Soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for use singly or in combination to meet the requirements for topsoil. Soil Conditioners will only be needed in Zone 3 areas or canal plug restoration.

2.5 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.5.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice furnished in air-dry condition, and with a consistency for placing with commercial mulch-blowing equipment.

2.5.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings furnished in an air-dry condition, suitable for placing with commercial mulch-blowing equipment.

2.5.3 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors, and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.6 WATER

Unless otherwise noted, water shall be the responsibility of the Contractor. Water shall not contain elements toxic to plant life.

2.7 PESTICIDE

Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification, soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

PART 3 EXECUTION

3.1 INSTALLING SPRIGS TIME AND CONDITIONS

3.1.1 Sprigging Time

Sprigs shall be installed from 15 Feb to 15 Apr for spring establishment.

3.1.2 Sprigging Conditions

Sprigging operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed.

When special conditions warrant a variance to the sprigging operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of sprigging operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. Provide the calibration test results within 1 week of testing.

3.1.4 Soil Test

Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection onsite shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the sprig cultivar specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

Prior to the commencement of sprigging operation, the Contractor shall verify that finished grades are as indicated on drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 02300 EARTHWORK.

3.2.2 Applying Fertilizer

The fertilizer shall be applied at the rate recommended by the soil test. Fertilizer shall be in pellet form, slow release commercial grade and dropped in the hole.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum depth of 4 inches. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum depth of 2 inches by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1-horizontal-to-1 vertical and steeper, no tillage is required. Drainage patterns shall be maintained as indicated

on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The pH adjuster, fertilizer and soil conditioner may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Protection

Areas with the prepared surface shall be protected from compaction and damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing sprigs, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Areas shall be sprigged as indicated.

3.3.1 Row Sprigging

Sprigs shall be planted in rows spaced a maximum of 12 inches apart and to a minimum 8 inches depth, with mechanical sprig planter or other methods. Sprigs shall be placed in the rows a maximum 6 inch distance apart.

3.3.2 Mulching

3.3.2.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 2 tons per acre.

Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.3.2.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.2.3 Wood Cellulose Fiber

Wood cellulose fiber shall be applied as part of the hydroseeding operation. The mulch shall be mixed and applied in accordance with the manufacturer's recommendations.

3.3.3 Applying Seed Over Sprigs

Seed shall be applied using either broadcast or hydroseeding equipment and methods. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used.

3.3.3.1 Broadcast Seeding

Seed shall be uniformly broadcast per the VESCH using broadcast seeders. Half the total rate of seed application shall be broadcast in 1 direction, with the remainder of the seed rate broadcast at 90 degrees from the first direction. Seed shall be covered to a minimum 1/4 inch depth by disk harrow, steel mat drag, cultipacker, or other approved device. Seed shall be broadcast and covered prior to sprigging operation.

3.3.3.2 Hydroseeding

Seed shall be mixed to ensure broadcast at the rate per the VESCH. Seed and fertilizer shall be added to water and thoroughly mixed at the rates specified. The maximum time period for the seed to be held in the slurry shall be 24 hours. Wood cellulose fiber mulch and tackifier shall be added at the rates recommended by the manufacturer after the seed, fertilizer, and water have been thoroughly mixed to produce a homogeneous slurry. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled.

3.3.4 Finishing

A minimum 25 percent of the installed sprigs shall extend above the ground surface upon completion of the sprigging operation.

3.4 RESTORATION AND CLEAN UP

3.4.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the sprigging operation shall be restored to original condition at Contractor's expense.

3.4.2 Clean Up

Excess and waste material shall be removed from the sprigged areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.5 SPRIG ESTABLISHMENT PERIOD

3.5.1 Commencement

The sprig establishment period to obtain a healthy stand of grass plants shall commence on the first day of speigging work under this contract and shall continue through the remaining life of the contract and end 242 months after the last day of sprigging operations required by this contract. Written calendar time period shall be furnished for the sprig establishment period. When there is more than 1 sprig establishment period, the boundaries of the sprigged area covered for each period shall be described.

The sprig establishment period shall be coordinated with Sections 02921 SEEDING and 02930 EXTERIOR PLANTING. The sprig establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.5.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for cultivar and health when grass plants are a minimum 1 inch high. Density Criteria are found in Sec 01005 (Project Monitoring/Corrective Action).

3.5.3 Maintenance During Establishment Period

Maintenance of the sprigged areas shall include protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic.

3.5.3.1 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.5.3.2 Repair

Unsatisfactory stand of grass plants shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with Sec 01005 Project Monitoring/Corrective Action..

-- End of Section --

SECTION 02930

EXTERIOR PLANTING
01/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A300 (1995) Tree Care Operations - Trees,
Shrubs and Other Woody Plant Maintenance

AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (ANLA)

ANLA Z60.1 (1996) Nursery Stock

ASTM INTERNATIONAL (ASTM)

ASTM C 602 (1995a; R 2001) Agricultural Liming
Materials

ASTM D 4972 (2001) pH of Soils

ASTM D 5034 (1995; R 2001) Breaking Strength and
Elongation of Textile Fabrics (Grab Test)

ASTM D 5035 (1995) Breaking Force and Elongation of
Textile Fabrics (Strip Method)

ASTM D 5268 (1992; R 1997) Topsoil Used for
Landscaping Purposes

ASTM D 5883 (1996; R 2002) Use of Rotary Kiln Produced
Expanded Shale, Clay or Slate (ESCS) as a
Mineral Amendment in Topsoil Used for
Landscaping and Related Purposes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings

Scale drawings defining areas to receive plant materials.

Finished Grade, Topsoil and Underground Utilities

Finished grade status; location of underground utilities and facilities; and availability of topsoil from the stripping and stock piling operation.

SD-03 Product Data

Geotextile
Chemical Treatment Material

Manufacturer's literature including physical characteristics, application and installation instructions for geotextile and chemical treatment material.

Equipment

A listing of equipment to be used for the planting operation.

Delivery

Delivery schedule.

Plant Establishment Period; G

Calendar time period for the plant establishment period. When there is more than one establishment period, the boundaries of the planted areas covered for each period shall be described.

Maintenance Record

Maintenance work performed, quantity of plant losses, and replacements; and diagnosis of unhealthy plant material.

Application of Pesticide

Pesticide treatment plan with sequence of treatment work with dates and times. The pesticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material, application rate of active ingredients, method of application, area treated, amount applied; and the name and state license number of the state certified applicator shall be included.

SD-04 Samples

Soil Amendments

A 10 pound sample.

Mulch

A 10 pound sample.

Geotextile

A 6 inch square sample.

SD-06 Test Reports

Soil Test
Percolation Test

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

Plant Material
Fertilizer
Organic Mulch

Prior to delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following.

- a. Plant Material: Classification, botanical name, common name, size, quantity by species, and location where grown.
- b. Fertilizer: Chemical analysis and composition percent.
- c. Organic Mulch: Composition, source, and treatment against fungi growth.
- d. Mycorrhizal Fungi Inoculum: Plant material treated.
- e. Pesticide. EPA registration number and registered uses.

SD-10 Operation and Maintenance Data

Maintenance Instructions

Instruction for year-round care of installed plant material.

1.3 SOURCE INSPECTIONS

The nursery or source of plant material and the source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Plant Material Identification

Plant material shall be identified with attached, durable, waterproof labels and weather-resistant ink, stating the correct botanical plant name and size.

1.4.1.2 Protection During Delivery

Plant material shall be protected during delivery to prevent desiccation and damage to the branches, trunk, root system, or earth ball. Branches shall be protected by tying-in. Exposed branches shall be covered during transport.

1.4.1.3 Pesticide Material

Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration number and the manufacturer's registered uses.

1.4.2 Inspection

Plant material shall be well shaped, vigorous and healthy with a healthy, well branched root system, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion. Plant material shall be checked for unauthorized substitution and to establish nursery grown status. Plant material showing desiccation, abrasion, sun-scald injury, disfigurement, or unauthorized substitution shall be rejected. The plant material shall exhibit typical form of branch to height ratio; and meet the caliper and height measurements specified. Plant material that measures less than specified, or has been poled, topped off or headed back, shall be rejected. Container-grown plant material shall show new fibrous roots and the root mass shall contain its shape when removed from the container. Plant material with broken or cracked balls; or broken containers shall be rejected. Bare-root plant material that is not dormant or is showing roots were pulled from the ground shall be rejected. Other materials shall be inspected for compliance with paragraph PRODUCTS. Open soil amendment containers or wet soil amendments shall be rejected. Unacceptable material shall be removed from the job site.

1.4.3 Storage

1.4.3.1 Plant Material Storage

Plant material not installed on the day of arrival at the site shall be stored and protected in designated areas. Plant material shall not be stored longer than 30 days. Plant material shall be protected from direct exposure to wind and sun. Bare-root plant material shall be heeled-in. All plant material shall be kept in a moist condition by watering with a fine mist spray until installed.

1.4.3.2 Other Material Storage

Storage of other material shall be in designated areas. Soil amendments shall be stored in dry locations and away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with planting operation material.

1.4.4 Handling

Plant material shall not be injured in handling. Cracking or breaking the earth ball of balled and burlapped plant material shall be avoided. Plant material shall not be handled by the trunk or stems. Materials shall not be dropped from vehicles.

1.4.5 Time Limitation

Except for container-grown plant material, the time limitation from digging

to installing plant material shall be a maximum 90 days. The time limitation between installing the plant material and placing the mulch shall be a maximum 24 hours.

1.5 WARRANTY

Furnished plant material shall have a warranty for plant growth to be in a vigorous growing condition for a minimum 24 month period. A minimum 24 month calendar time period for the warranty of plant growth shall be provided regardless of the contract time period. When plant material is determined to be unhealthy in accordance with paragraph PLANT ESTABLISHMENT PERIOD, it shall be replaced once under this warranty.

PART 2 PRODUCTS

2.1 PLANT MATERIAL

2.1.1 Plant Material Classification

The plant material shall be nursery grown stock conforming to ANLA Z60.1 and shall be the species specified.

2.1.2 Plant Schedule

The plant schedule shall provide botanical names as included in one or more of the publications listed under "Nomenclature" in ANLA Z60.1.

2.1.3 Substitutions

Substitutions will not be permitted without written request and approval from the Contracting Officer.

2.1.4 Quality

Well shaped, well grown, vigorous plant material having healthy and well branched root systems in accordance with ANLA Z60.1 shall be provided. Plant material shall be provided free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Plant material shall be free of shock or damage to branches, trunk, or root systems, which may occur from the digging and preparation for shipment, method of shipment, or shipment. Plant quality is determined by the growing conditions; method of shipment to maintain health of the root system; and growth of the trunk and crown as follows.

2.1.5 Growing Conditions

Plant material shall be native to or well-suited to the growing conditions of the project site. Plant material shall be grown under climatic conditions similar to those at the project site.

2.1.6 Method of Shipment to Maintain Health of Root System

2.1.6.1 Balled and Burlapped (BB) Plant Material

Ball size and ratio shall be in accordance with ANLA Z60.1. The ball shall be of a diameter and depth to encompass enough fibrous and feeding root system necessary for the full recovery of the plant. The plant stem or trunk shall be centered in the ball. All roots shall be clean cut at the ball surface. Roots shall not be pulled from the ground. Before shipment

the root ball shall be dipped in gels containing mycorrhizal fungi inoculum. The root ball shall be completely wrapped with burlap or other suitable material and securely laced with biodegradable twine.

2.1.6.2 Balled and Potted (Pot) Plant Material

Ball size and ratio shall be in accordance with ANLA Z60.1. The ball shall be of a diameter and depth to encompass enough fibrous and feeding root system necessary for the full recovery of the plant. Removal shall be done by hand digging or mechanical devices. The plant stem or trunk shall be centered in the ball. All roots shall be clean cut at the ball surface. Roots shall not be pulled from the ground. Before shipment the root ball shall be dipped in gels containing mycorrhizal fungi inoculum. Container shall be used to retain the ball unbroken. Container shall be rigid to hold ball shape and protect root mass during shipping.

2.1.6.3 Balled and Platform (BP) Plant Material

Ball size and ratio shall be in accordance with ANLA Z60.1. Plants shall be prepared as balled and burlapped plant material and securely fastened to wood platform for shipping.

2.1.6.4 Bare-Root (BR) Plant Material

Minimum root spread shall be in accordance with ANLA Z60.1. A well branched root system characteristic of the species specified shall be provided. Roots shall not be pulled from the ground. Bare-root plant material shall be inoculated with mycorrhizal fungi during germination in the nursery. Before shipment the root system shall be dipped in gels containing mycorrhizal fungi inoculum. Bare-root plant material shall be dormant. The root system shall be protected from drying out.

2.1.6.5 Container-Grown (C) Plant Material

Container size shall be in accordance with ANLA Z60.1. Plant material shall be grown in a container over a duration of time for new fibrous roots to have developed and for the root mass to retain its shape and hold together when removed from the container. Container-grown plant material shall be inoculated with mycorrhizal fungi during germination in the nursery. Before shipment the root system shall be dipped in gels containing mycorrhizal fungi inoculum. The container shall be sufficiently rigid to hold ball shape and protect root mass during shipping.

2.1.7 Growth of Trunk and Crown

2.1.7.1 Deciduous Trees

A height to caliper relationship shall be provided in accordance with ANLA Z60.1. Height of branching shall bear a relationship to the size and species of tree specified and with the crown in good balance with the trunk. The trees shall not be "poled" or the leader removed.

- a. Single stem: The trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader.
- b. Multi-stem: All countable stems, in aggregate, shall average the size specified. To be considered a stem, there shall be no division of the trunk which branches more than 6 inches from ground level.

- c. Specimen: The tree provided shall be well branched and pruned naturally according to the species. The form of growth desired, which may not be in accordance with natural growth habit, shall be as indicated.

2.1.7.2 Deciduous Shrubs

Deciduous shrubs shall have the height and number of primary stems recommended by ANLA Z60.1. Acceptable plant material shall be well shaped, with sufficient well-spaced side branches, and recognized by the trade as typical for the species grown in the region of the project.

2.1.7.3 Coniferous Evergreen Plant Material

Coniferous Evergreen plant material shall have the height-to-spread ratio recommended by ANLA Z60.1. The coniferous evergreen trees shall not be "poled" or the leader removed. Acceptable plant material shall be exceptionally heavy, well shaped and trimmed to form a symmetrical and tightly knit plant. The form of growth desired shall be as indicated.

2.1.7.4 Broadleaf Evergreen Plant Material

Broadleaf evergreen plant material shall have the height-to-spread ratio recommended by ANLA Z60.1. Acceptable plant material shall be well shaped and recognized by the trade as typical for the variety grown in the region of the project.

2.1.7.5 Ground Cover and Vine Plant Material

Ground cover and vine plant material shall have the minimum number of runners and length of runner recommended by ANLA Z60.1. Plant material shall have heavy, well developed and balanced crown with vigorous, well developed root system and shall be furnished in containers.

2.1.8 Plant Material Size

Plant material shall be furnished in sizes indicated. Plant material larger in size than specified may be provided at no additional cost to the Government.

2.1.9 Plant Material Measurement

Plant material measurements shall be in accordance with ANLA Z60.1.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite in accordance with Section 02300 EARTHWORK.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, organic material and soil conditioners meeting the following requirements. Vermiculite is not recommended.

2.3.1 Limestone

Limestone material shall contain a minimum calcium carbonate equivalent of 80 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 55 percent shall pass through a No. 60 sieve. To raise soil pH, ground limestone shall be used.

2.3.2 Hydrated Lime

Hydrated lime shall contain a minimum calcium carbonate equivalent of 110 percent. Gradation: A minimum 100 percent shall pass through a No. 8 sieve and a minimum 97 percent shall pass through a No. 60 sieve.

2.3.3 Burnt Lime

Burnt lime shall contain a minimum calcium carbonate equivalent of 140 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 35 percent shall pass through a No. 60 sieve.

2.3.4 Fertilizer

It shall be as recommended by the soil test. Fertilizer shall be controlled release commercial grade; free flowing, pellet or tablet form; uniform in composition; and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.5 Organic Material

Organic material shall consist of either bonemeal, peat, rotted manure, decomposed wood derivatives, recycled compost, or worm castings.

2.3.5.1 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, or other wood waste material free of sticks, and toxic substances harmful to plants, and stabilized with nitrogen.

2.3.5.2 Worm Castings

Worm castings shall be screened from worms and food source and shall be commercially packaged.

2.3.6 Soil Conditioner

Soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for single use or in combination to meet topsoil requirements for the plant material specified.

2.3.6.1 Sand

Sand shall be clean and free of toxic materials. Gradation: A minimum 95 percent by weight shall pass a No. 10 sieve and a minimum 10 percent by weight shall pass a No. 16 sieve. Greensand shall be balanced with the inclusion of trace minerals and nutrients.

2.3.6.2 Super Absorbent Polymers

To improve water retention in soils, super absorbent polymers shall be sized according to manufacturer's recommendations. Polymers shall be added as a soil amendment and be cross-linked polyacrylamide with an absorption capacity of 250-400 times its weight.

2.3.6.3 Calcined Clay

Granular particles shall be produced from montmorillonite clay calcined to minimum temperature of 1200 degrees F. Gradation: A minimum 90 percent passing No. 8 sieve; a minimum 99 percent shall be retained on No. 60 sieve; and a maximum 2 percent shall pass a No. 100 sieve. Bulk density: A maximum 40 pounds per cubic foot.

2.3.6.4 Gypsum

Gypsum shall be commercially packaged, free flowing, and a minimum 95 percent calcium sulfate by volume.

2.3.6.5 Expanded Shale, Clay, or Slate (ESCS)

Rotary kiln produced ESCS material shall be in conformance with ASTM D 5883.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region. Rotted manure is not recommended to be used as a mulch because it would encourage surface rooting of the plant material and weeds.

2.4.1 Organic Mulch

Organic mulch materials shall be native to the project site and consist of recycled mulch, shredded bark, wood chips, or ground bark.

2.4.1.1 Recycled Mulch

Recycled mulch may include compost, tree trimmings, or pine needles with a gradation that passes through a 2-1/2 x 2-1/2 inch screen. It shall be cleaned of all sticks a minimum 1 inch in diameter and plastic materials a minimum 3 inch length. The material shall be treated to retard the growth of mold and fungi. Other recycled mulch may include peanut shells, pecan shells or coco bean shells.

2.4.1.2 Shredded Bark

Locally shredded material shall be treated to retard the growth of mold and fungi.

2.4.1.3 Wood Chips and Ground Bark

Locally chipped or ground material shall be treated to retard the growth of mold and fungi. Gradation: A maximum 2 inch wide by 4 inch long.

2.5 TREE ROOT BARRIERS

Tree root barriers shall be metal or plastic consisting of recycled content. Barriers shall utilize vertical stabilizing members to encourage downward tree root growth. Barriers shall limit, by a minimum 90 percent, the occurrence of surface roots. Tree root barriers which are designed to

be used as plant pit liners will be rejected.

2.6 MYCORRHIZAL FUNGI INOCULUM

Mycorrhizal fungi inoculum shall be composed of multiple-fungus inoculum as recommended by the manufacturer for the plant material specified.

2.7 WATER

Unless otherwise directed, water shall be the responsibility of the Contractor. Water shall not contain elements toxic to plant life.

2.8 PESTICIDE

Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification a soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

PART 3 EXECUTION

3.1 INSTALLING PLANT MATERIAL TIME AND CONDITIONS

3.1.1 Deciduous Plant Material Time

Deciduous plant material shall be installed per nursery's recommendations.

3.1.2 Evergreen Plant Material Time

Evergreen plant material shall be installed per nursery's recommendations.

3.1.3 Plant Material Conditions

Planting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted for approval.

3.2 SITE PREPARATION

3.2.1 Finished Grade, Topsoil and Underground Utilities

The Contractor shall verify that finished grades are as indicated on drawings, and that the placing of topsoil, the smooth grading, and the compaction requirements have been completed in accordance with Section 02300 EARTHWORK, prior to the commencement of the planting operation. The location of underground utilities and facilities in the area of the planting operation shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.2.2 Layout

Plant material locations and bed outlines shall be staked on the project site before any excavation is made. Plant material locations may be adjusted to meet field conditions.

3.2.3 Protecting Existing Vegetation

When there are established native vegetation in the planting area, these shall be preserved during planting operations.

3.3 EXCAVATION

3.3.1 Obstructions Below Ground

When obstructions below ground affect the work, shop drawings showing proposed adjustments to plant material location, type of plant and planting method shall be submitted for approval.

3.3.2 Plant Pits

Plant pits for ball and burlapped or container plant material shall be dug to a depth equal to the height of the root ball as measured from the base of the ball to the base of the plant trunk. Plant pits for bare-root plant material shall be dug to a depth equal to the height of the root system. Plant pits shall be dug a minimum 50 percent wider than the ball or root system to allow for root expansion. The pit shall be constructed with sides sloping towards the base as a cone, to encourage well aerated soil to be available to the root system for favorable root growth. Cylindrical pits with vertical sides shall not be used.

3.4 INSTALLATION

3.4.1 Setting Plant Material

Plant material shall be set plumb and held in position until sufficient soil has been firmly placed around root system or ball. In relation to the surrounding grade, the plant material shall be set even with the grade at which it was grown.

3.4.1.1 Bare-Root Plant Material

Bare-root plant material shall be placed in water a minimum 30 minutes prior to setting.

3.4.2 Tree Root Barrier

Tree root barriers shall be installed as recommended by the manufacturer. Tree root barriers shall be used for trees located up to a maximum 6 feet from paved surfaces or structures.

3.4.3 Backfill Soil Mixture

The backfill soil mixture may be a mix of topsoil and soil amendments suitable for the plant material specified. When practical, the excavated soil from the plant pit that is not amended provides the best backfill and shall be used.

3.4.4 Adding Mycorrhizal Fungi Inoculum

Mycorrhizal fungi inoculum shall be added as recommended by the manufacturer for the plant material specified.

3.4.5 Backfill Procedure

Prior to backfilling, all metal, wood, synthetic products, or treated burlap devices shall be removed from the ball or root system avoiding

damage to the root system. The backfill procedure shall remove air pockets from around the root system. Additional requirements are as follows.

3.4.5.1 Balled and Burlapped, and Balled and Platformed Plant Material

Biodegradable burlap and tying material shall be carefully opened and folded back from the top a minimum 1/3 depth from the top of the root ball. Backfill mixture shall be added to the plant pit in 6 inch layers with each layer tamped.

3.4.5.2 Bare-Root Plant Material

The root system shall be spread out and arranged in its natural position. Damaged roots shall be removed with a clean cut. The backfill soil mixture shall be carefully worked in amongst the roots and watered to form a soupy mixture. Air pockets shall be removed from around the root system, and root to soil contact shall be provided.

3.4.5.3 Container-Grown and Balled and Potted Plant Material

The plant material shall be carefully removed from containers that are not biodegradeable. Prior to setting the plant in the pit, a maximum 1/4 depth of the root mass, measured from the bottom, shall be spread apart to promote new root growth. For plant material in biodegradable containers the container shall be split prior to setting the plant with container. Backfill mixture shall be added to the plant pit in 6 inch layers with each layer tamped.

3.4.6 Watering

Plant pits and plant beds shall be watered immediately after backfilling, until completely saturated.

3.5 FINISHING

3.5.1 Plant Material

The installed area shall be raked and smoothed while maintaining the earth berms in area of canal plug.

3.5.2 Placing Mulch

The placement of mulch shall occur a maximum 48 hours after planting. Mulch, used to reduce soil water loss, regulate soil temperature and prevent weed growth, shall be spread to cover the installed area with a minimum 4 inch uniform thickness. Mulch shall be kept out of the crowns of shrubs, ground cover, and vines and shall be kept off buildings, sidewalks and other facilities.

3.6 MAINTENANCE DURING PLANTING OPERATION

Installed plant material shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed to prevent desiccation and shall continue until the plant establishment period commences. Installed areas shall be kept free of weeds, grass, and other undesired vegetation including invasives. The maintenance includes maintaining the mulch, and adjusting settling.

3.7 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

3.7.1 Technical Representative

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control. They may be present during treatment application.

3.7.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately.

3.8 RESTORATION AND CLEAN UP

3.8.1 Restoration

Facilities that have been damaged from the planting operation shall be restored to original condition at the Contractor's expense.

3.8.2 Clean Up

Excess and waste material shall be removed from the installed area and shall be disposed offsite. Adjacent paved areas shall be cleared.

3.9 PLANT ESTABLISHMENT PERIOD

3.9.1 Commencement

The plant establishment period for maintaining exterior plantings in a healthy growing condition shall commence on the first day of exterior planting work under this contract and shall continue through the remaining life of the contract and end 24 months after the last day of exterior planting required by this contract. Written calendar time period shall be furnished for the plant establishment period. When there is more than one plant establishment period, the boundaries of the planted area covered for each period shall be described. The plant establishment period shall be coordinated with Sections 02921 SEEDING; and 02923 SPRIGGING. The plant establishment period shall be modified for inclement weather shut down periods, or for separate completion dates for areas.

3.9.2 Maintenance During Establishment Period

Maintenance of plant material shall include supplementing mulch; pruning dead or broken branch tips; maintaining plant material labels; and removing and replacing unhealthy plants in accordance with Sec 01005, Project Monitoring/Corrective Action.

3.9.2.1 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.9.2.2 Plant Pit Settling

When settling occurs to the backfill soil mixture, additional backfill soil shall be added to the plant pit or plant bed until the backfill level is equal to the surrounding grade. Serious settling that affects the setting of the plant in relation to the maximum depth at which it was grown requires replanting in accordance with paragraph INSTALLATION. The earth berm shall be maintained.

3.9.2.3 Maintenance Record

Monitoring/Corrective Action shall be in accordance with Sec 01005, Project Monitoring/Corrective Action..

3.9.3 Unhealthy Plant Material

A tree shall be considered unhealthy or dead when the main leader has died back, or up to a maximum 25 percent of the crown has died. A shrub shall be considered unhealthy or dead when up to a maximum 25 percent of the plant has died. This condition shall be determined by scraping on a branch an area 1/16 inch square, maximum, to determine if there is a green cambium layer below the bark. The Contractor shall determine the cause for unhealthy plant material and shall provide recommendations for replacement.

Unhealthy or dead plant material shall be removed immediately and shall be replaced as soon as seasonal conditions permit.

3.9.4 Replacement Plant Material

Unless otherwise directed, plant material shall be provided for replacement in accordance with paragraph PLANT MATERIAL. Replacement plant material shall be installed in accordance with paragraph INSTALLATION, and recommendations in paragraph PLANT ESTABLISHMENT PERIOD. Plant material shall be replaced in accordance with paragraph WARRANTY. An extended plant establishment period shall not be required for replacement plant material.

-- End of Section --